

Application No. 10/691,156
Amendment dated March 9, 2005
Preliminary Amendment

Docket No. 1232-5179

APPROVED
FOR ENTRY
4/05/2005
DAVID SPECTOR
PRIMARY EXAMINER

Amendments to the Claims:

Claims 1-28 are pending in this application.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (CURRENTLY AMENDED): An optical apparatus comprising:

a movable lens movable in an optical axis direction;

~~a lens drive unit which drives the movable lens;~~

~~an a manual operating member operable within a predetermined movable range~~

rotatable about an optical axis;

~~an operating member drive unit which drives the operating member within the predetermined movable range;~~

~~an operating member position detector which outputs a signal for detecting the position of the operating member;~~

a detector which detects a rotational position of the manual operating member;

and

a signal output unit which outputs a signal for moving the movable lens; and

~~a controller which controls the drive of the lens drive unit and the operating member drive unit;~~

~~wherein the controller controls the drive of the lens drive unit based on the signal from the operating member position detector and controls the drive of the operating member drive unit based on the lens moves in the optical axis direction based on a detection result of the~~

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detector, the detector detecting the rotational position of the manual operating member having rotated on the basis of the signal from the signal output unit.

2-9 (CANCELLED):

⁹
~~10~~ (CURRENTLY AMENDED): An optical apparatus comprising:

a movable lens movable in an optical axis direction;

a lens drive unit which drives the movable lens;

an operating member operable within a predetermined movable range; an operating member drive unit which drives the operating member within the predetermined movable range;

an operating member position detector which outputs a signal for detecting the position of the operating member;

a signal output unit which outputs a first signal and a second signal, each of which is a signal for moving the movable lens; and

a controller which controls the drive of the lens drive unit and the operating member drive unit [[:]],

wherein the controller controls the drive of the lens drive unit based on the signal from the operating member position detector, controls the drive of the operating member drive unit based on the first signal, and furthermore controls directly the drive of the lens drive unit based on the second signal.

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¹⁰
~~11~~ (CURRENTLY AMENDED): The optical apparatus according to claim ⁹~~10~~, comprising:
an optical system which comprises a variable power lens; and a focus lens as the movable lens,
positioned at the image plane side of the variable power lens and performing focusing and
compensation of the image plane variation that accompanies the movement of the variable power
lens [[:]], wherein the first signal is a signal for moving the focus lens in accordance with the
detection result of the focusing state of the optical system, and the second signal is a signal for
moving the focus lens back and forth in the optical axis direction for an in-focus position search.

¹¹
~~12~~ (ORIGINAL): The optical apparatus according to claim ⁹~~10~~, comprising: a lens apparatus
which comprises the movable lens; and a camera to which the lens apparatus is mounted.

¹²
~~13~~ (CURRENTLY AMENDED): A lens apparatus mountable to a camera, comprising:
a movable lens movable in an optical axis direction;
a lens drive unit which drives the movable lens;
an operating member operable within a predetermined movable range;
an operating member drive unit which drives the operating member within the
predetermined movable range;
an operating member position detector which outputs a signal for detecting the
position of the operating member, and
a controller which receives a first signal and a second signal, each of which is a
signal for moving the movable lens and is sent from the camera, and controls the drive of the
lens drive unit and the operating member drive unit [[:]].

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wherein the controller controls the drive of the lens drive unit based on the signal from the operating member position detector, controls the drive of the operating member drive unit based on the first signal, and controls directly the drive of the lens drive unit based on the second signal.

¹³
~~14~~ (CURRENTLY AMENDED): The optical lens apparatus according to claim ¹³~~13~~, comprising: an optical system which comprises a variable power lens; and a focus lens as the movable lens, positioned at the image plane side of the variable power lens and performing focusing and compensation of the image plane variation that accompanies the movement of the variable power lens [[:]] ,

wherein the first signal is a signal for moving the focus lens in accordance with the detection result of the focusing state of the optical system, and the second signal is a signal for moving the focus lens back and forth in the optical axis direction for an in-focus position search.

¹⁴
~~15~~ (CURRENTLY AMENDED): An optical apparatus comprising:
a movable lens movable in an optical axis direction;
a lens drive unit which drives the movable lens;
an operating member operable within a predetermined movable range;
an operating member drive unit which drives the operating member within the predetermined movable range;
an operating member position detector which outputs a signal for detecting the

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position of the operating member;

a signal output unit which outputs a signal for moving the movable lens;

a controller which controls the drive of the lens drive unit based on the signal from the operating member position detector and controls the drive of the operating member drive unit based on the signal from the signal output unit;

a switching mechanism switchable between a transmitting state, in which a drive force is transmitted from the operating member drive unit to the operating member, and a non-transmitting state, in which the drive force is not transmitted; and

a switching detector which outputs a signal for detecting the state of the switching mechanism [[:]] .

wherein the controller controls the drive of the operating member drive unit based on the signal from the signal output unit when the switching mechanism is detected to be in the transmitting state by the signal from the switching detector, and restricts the drive of the operating member drive unit based on the signal from the signal output unit when the switching mechanism is detected to be in the non-transmitting state.

¹⁵/₁₆ (ORIGINAL): The optical apparatus according to claim ¹⁴/₁₅, wherein the controller performs a warning operation when the signal from the signal output unit is input with the switching mechanism being in the non-transmitting state.

17 (CANCELLED):

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¹⁶
~~18~~ (ORIGINAL): The optical apparatus according to claim ¹⁴~~15~~, comprising: a lens apparatus which comprises the movable lens; and a camera to which the lens apparatus is mounted.

¹⁷
~~19~~ (CURRENTLY AMENDED): A lens apparatus mountable to a camera, comprising:
a movable lens movable in an optical axis direction; a lens drive unit which drives the movable lens;
an operating member operable within a predetermined movable range;
an operating member drive unit which drives the operating member within the predetermined movable range;
an operating member position detector which outputs a signal for detecting the position of the operating member; a controller which controls the drive of the lens drive unit based on the signal from the operating member position detector, and controls the drive of the operating member drive unit based on a signal for moving the movable lens that is sent from the camera;
a switching mechanism switchable between a transmitting state, in which a drive force is transmitted from the operating member drive unit to the operating member, and a non-transmitting state, in which the drive force is not transmitted; and
a switching detector which outputs a signal for detecting the state of the switching mechanism [[:]] .

wherein the controller controls the drive of the operating member drive unit based on the signal from the camera when the switching mechanism is detected to be in the transmitting state by the signal from the switching detector, and restricts the drive of the

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operating member drive unit based on the signal from the camera when the switching mechanism is detected to be in the non-transmitting state.

¹⁸
20 (CURRENTLY AMENDED): The ~~optical~~ lens apparatus according to claim ¹⁷19, wherein the controller performs a warning operation when the signal from the camera is input with the switching mechanism being in the non-transmitting state.

21 (CANCELLED):

¹⁹
22 (CURRENTLY AMENDED): An optical apparatus comprising:

- a movable lens movable in an optical axis direction;
- a lens drive unit which drives the movable lens;
- an operating member operable within a predetermined movable range;
- an operating member drive unit which drives the operating member within the predetermined movable range;
- an operating member position detector which outputs a signal for detecting the position of the operating member;
- a signal output unit which outputs a signal for moving the movable lens; a controller which controls the drive of the lens drive unit based on the signal from the operating member position detector and controls the drive of the operating member drive unit based on the signal from the signal output unit; a switching mechanism switchable between a transmitting state, in which a drive force is transmitted from the operating member drive unit to the operating

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member, and a non-transmitting state, in which the drive force is not transmitted;

a switching detector which outputs a signal for detecting the state of the switching mechanism; and a switching drive unit which actuates the switching mechanism [[:]] ,

wherein the controller drives the switching drive unit to switch the switching mechanism from the transmitting state to the non-transmitting state when the switching mechanism is detected to be in the transmitting state by the signal from the switching detector and there is a change in the signal from the operating member position detector while the operating member drive unit is not driven.

²⁰
~~23~~²²(ORIGINAL): The optical apparatus according to claim ~~22~~²², comprising: a lens apparatus which comprises the movable lens; and a camera to which the lens apparatus is mounted.

²¹
~~24~~(CURRENTLY AMENDED): A lens apparatus mountable to a camera, comprising:

a movable lens movable in an optical axis direction;

a lens drive unit which drives the movable lens;

an operating member operable within a predetermined movable range; an operating member drive unit which drives the operating member within the predetermined movable range;

an operating member position detector which outputs a signal for detecting the position of the operating member;

a controller which controls the drive of the lens drive unit based on the signal from the operating member position detector, and controls the drive of the operating member

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drive unit based on a signal for moving the movable lens that is sent from the camera;

a switching mechanism switchable between a transmitting state, in which a drive force is transmitted from the operating member drive unit to the operating member, and a non-transmitting state, in which the drive force is not transmitted;

a switching detector which outputs a signal for detecting the state of the switching mechanism; and

a switching drive unit which actuates the switching mechanism [[:]] ,

wherein the controller drives the switching drive unit to switch the switching mechanism from the transmitting state to the non-transmitting state when the switching mechanism is detected to be in the transmitting state by the signal from the switching detector and there is a change in the signal from the operating member position detector while the operating member drive unit is not driven.

²²
~~25~~(CURRENTLY AMENDED): An optical apparatus comprising:

a movable lens movable in an optical axis direction;

a lens drive unit which drives the movable lens;

an operating member operable within a predetermined movable range;

an operating member drive unit which drives the operating member within the predetermined range;

an operating member position detector which outputs a signal for detecting the position of the operating member;

a signal output unit which outputs a signal for moving the movable lens;

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a memory which stores information indicating the correspondence between the position of the operating member and the position of the movable lens;

a controller which controls the drive of the lens drive unit based on the position information on the operating member detected by the signal from the operating member position detector and the correspondence information stored in the memory, and controls the drive of the operating member drive unit based on the signal from the signal output unit; and

an end position detector which outputs a signal for detecting that the operating member is positioned at an optical end corresponding position that is set at the inner side of the predetermined movable range [[:]] ,

wherein the controller corrects the correspondence information based on the position information on the operating member detected by the signal from the operating member position detector at the time the operating member has been detected to be positioned at the optical end corresponding position by the signal from the end position detector.

²³
~~26~~ (CURRENTLY AMENDED): A lens apparatus mountable to a camera, comprising:

a movable lens movable in an optical axis direction;

a lens drive unit which drives the movable lens;

an operating member operable within a predetermined movable range;

an operating member drive unit which drives the operating member in the predetermined range;

an operating member position detector which outputs a signal for detecting the position of the operating member;

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a memory which stores information indicating the correspondence between the position of the operating member and the position of the movable lens;

a controller which controls the drive of the lens drive unit based on the position information on the operating member detected by the signal from the operating member position detector and the correspondence information stored in the memory, and controls the drive of the operating member drive unit based on a signal for moving the movable lens that is sent from the camera; and

an end position detector which outputs a signal for detecting that the operating member is positioned at an optical end corresponding position that is set at the inner side of the predetermined movable range [[: and] .

wherein the controller corrects the correspondence information based on the position information on the operating member detected at the time the operating member has been detected to be positioned at the optical end corresponding position by the signal from the end position detector.

24
27 (CURRENTLY AMENDED): An optical apparatus comprising:

a movable lens movable in an optical axis direction;

a lens drive unit which drives the movable lens;

an operating member operable within a predetermined movable range;

an operating member drive unit which drives the operating member within the predetermined range;

an operating member position detector which outputs a signal for detecting the

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position of the operating member;

a signal output unit which outputs a signal for moving the movable lens;

a memory which stores information indicating the correspondence between the position of the operating member and the position of the movable lens;

a controller which controls the drive of the lens drive unit based on the position information on the operating member detected by the signal from the operating member position detector and the correspondence information stored in the memory, and controls the drive of the operating member drive unit based on the signal from the signal output unit; and

an end position detector which outputs a signal for detecting that the operating member is positioned at an optical end corresponding position that is set at the inner side of the predetermined movable range [[:]] ,

wherein the controller corrects the position information on the operating member that is used in controlling the drive of the lens drive unit, based on the position information on the operating member detected at the time the operating member has been detected to be positioned at the optical end corresponding position by the signal from the end position detector.

²⁵
~~28~~(CURRENTLY AMENDED): A lens apparatus mountable to a camera, comprising:

a movable lens movable in an optical axis direction;

a lens drive unit which drives the movable lens;

an operating member operable within a predetermined movable range;

an operating member drive unit which drives the operating member in the predetermined range;

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an operating member position detector which outputs a signal for detecting the position of the operating member;

a memory which stores information indicating the correspondence between the position of the operating member and the position of the movable lens;

a controller which controls the drive of the lens drive unit based on the position information on the operating member detected by the signal from the operating member position detector and the correspondence information stored in the memory, and control the drive of the operating member drive unit based on a signal for moving the movable lens that is sent from the camera; and

an end position detector which outputs a signal for detecting that the operating member is positioned at an optical end corresponding position that is set at the inner side of the predetermined movable range [[: and]] ,

wherein the controller corrects the position information on the operating member that is used in controlling the drive of the lens drive unit, based on the position information on the operating member detected at the time the operating member has been detected to be positioned at the optical end corresponding position by the signal from the end position detector.

²
~~29~~ (NEW): The optical apparatus according to claim 1, wherein the lens is not moved during repressing a rotating of the manual operating member even if the signal is output from the signal output unit.

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³
~~30~~(NEW): The optical apparatus according to claim 1, wherein the lens includes a zoom lens and, the signal output unit outputs a signal in accordance with an operating amount of a zoom operating member operated by a operator.

⁴
~~31~~(NEW): The optical apparatus according to claim 1, wherein the lens includes a focus lens and, the signal output unit outputs a signal in accordance with a focusing state detected through the lens.

⁵
~~32~~(NEW): The optical apparatus according to claim 1, wherein the lens directly moves based on the signal from the signal output unit when a movement amount of the lens in accordance with the signal for moving is smaller than a predetermined movement amount.

⁶
~~33~~(NEW): The optical apparatus according to claim 1, further comprising a second detector which detects a position of the lens, wherein a position of the lens is adjusted so that a correspondence will hold for the detection result of the detector and the detection result of the second detector.

⁷
~~34~~(NEW): The optical apparatus according to claim 1, wherein the manual operating member includes a display portion which displays position information of the lens.

⁸
~~35~~(NEW): The optical apparatus according to claim 1, wherein the optical apparatus is a digital camera or a video camera.

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²⁶
~~36~~ (NEW): A lens apparatus mountable to a camera, comprising:

- a lens movable in an optical axis direction;
- a manual operating member rotatable about an optical axis;
- a detector which detects a rotational position of the manual operating member;

and

- a signal output unit which outputs a signal for moving the lens,
- wherein the lens moves in the optical axis direction based on a detection result of the detector, the detector detecting the rotational position of the manual operating member having rotated on the basis of the signal from the signal output unit.

²⁷
~~37~~ (NEW): An optical apparatus comprising:

- a manual operating member rotatable about an optical axis;
- a drive unit which drives for rotating the manual operating member;
- a switching mechanism switchable between a transmitting state, in which a drive force is transmitted from the drive unit to the manual operating member, and a non-transmitting state, in which the drive force is not transmitted;
- a detector which detects a rotational position of the manual operating member;
- a lens movable in the optical axis direction based on a detection result of the detector; and
- a signal output unit which outputs a signal for moving the lens to the drive unit,
- wherein the switching mechanism is switched from the non-transmitting state to the transmitting state when the signal output unit outputs the signal.

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28

38 (NEW): A lens apparatus mountable to a camera, comprising:

- a manual operating member rotatable about an optical axis;
- a drive unit which drives for rotating the manual operating member;
- a switching mechanism switchable between a transmitting state, in which a drive force is transmitted from the drive unit to the manual operating member, and a non-transmitting state, in which the drive force is not transmitted;
- a detector which detects a rotational position of the manual operating member;
- a lens movable in the optical axis direction based on a detection result of the detector; and
- a signal output unit which outputs a signal for moving the lens to the drive unit,

wherein the switching mechanism is switched from the non-transmitting state to the, transmitting state when the signal output unit outputs the signal.
